

We claim:

1. A process for rectificatively separating fluids comprising (meth)acrylic monomers in a rectification column by directly cooling the vapor comprising (meth)acrylic monomers rising to the top of the rectification column to form top condensate comprising (meth)acrylic monomers, the condensation space at the top of the column being separated from the region of the rectification column containing the separating internals only by at least one chimney tray from which the top condensate form is removed from the rectification column, which comprises effecting the direct cooling of the vapor in the condensation space in at least two spray zones, which are spatially successive and are flowed through by vapor, by spraying supercooled top condensate comprising added polymerization inhibitor, and the temperature of the sprayed supercooled top condensate becoming lower from spray zone to spray zone in the flow direction of the vapor.
2. A process as claimed in claim 1, wherein a spray zone is supplied via annularly mounted spray nozzles.
3. A process as claimed in claim 2, wherein the spray nozzles are full cone spray nozzles whose opening angle is from 60° to 180°.
4. A process as claimed in claim 3, wherein the opening angle is from 90° to 120°.
5. A process as claimed in claim 3 or 4, wherein the spray cones overlap one and the same spray zone.
6. A process as claimed in any of claims 3 to 5, wherein the spray cones of spatially successive spray zones do not overlap.
7. A process as claimed in any of claims 3 to 6, wherein the spray cones of spatially successive spray zones just touch.
8. A process as claimed in any of claims 1 to 7, wherein the rectification column is flowed through by a molecular oxygen-containing gas.
9. A process as claimed in any of claims 1 to 8, wherein the condensation space has an offgas outlet.

10. A process as claimed in claim 9, wherein the condensation space is an empty pipe which narrows conically toward the offgas outlet.
- 5 11. A process as claimed in any of claims 1 to 10, wherein the chimney tray has a slope on all sides toward the inner wall of the condensation space.
- 10 12. A process as claimed in any of claims 1 to 11, wherein chimney and chimney tray are configured with thermal isolation against the section of the rectification column containing the separating internals.
13. A process as claimed in any of claims 1 to 12, wherein chimney and chimney tray have a double-walled configuration.
- 15 14. A process as claimed in claim 13, wherein trace heating is mounted to the upper surface of the inner of the two walls.
15. A rectification column comprising a section which contains separating internals and is completed at the top by at least one chimney tray and is continued into a spray condenser having at least two spray zones.